REMARKS

Claims 30-51 are present in this application. Claims 1-29 have been canceled. Claims 30, 34, 41, 48-51 are independent.

Objection to the Abstract

The Abstract has been objected to and various corrections have been recommended. Accordingly, a replacement Abstract is attached hereto. Applicants respectfully request that the objection be withdrawn.

Claim Objections/Rejections

Claim 29 has been objected to as being in improper multiple dependent form. Claims 16-25 have been objected to for various informalities. Claims 3, 4, 13, 14, 22, and 23 have been rejected under 35 U.S.C. 112, second paragraph. All claims have been rejected based on prior art.

As claims 1-29 have been canceled, the present rejections are no longer applicable. Furthermore, Applicants submit that new claims 30-51 distinguish over the prior art references MacDonald et al. (U.S. Patent 5,537,416) and Lockhart et al. (U.S. Patent 6,161,207).

Summary of the Present Invention

The communications apparatus of the present invention is directed to an approach to retransmission control to improve quality of communication. In particular, the communication apparatus retransmits uncorrectable parts found in error

correction along with regular transmission parts for efficient use of bandwidth and better realtime data communications.

In a preferred embodiment, in video or like data communications, data fed to a data memory (501 in Fig. 8) in a transmitter must be reproduced in a receiver within a certain period of time. So, the transmitter must transmit the data to the receiver before the reproduction time. To successfully transmit the data to the receiver before a scheduled reproduction time, it must be ensured that the delay time for each set of data which occurs in the data memory between input and transmission is substantially constant.

For example, a bandwidth for transmission of b+1 blocks is always set aside in a data packet (as described in the present specification, page 8, line 16 to page 9, line 15). In normal circumstances (no errors), b blocks are transmitted, with the one remaining block reserved for a retransmission. Thus, when a block, a retransmission of which has been requested, is to be added to the blocks constituting the data packet, all the blocks which originally belong to the data packet can be transmitted simultaneously with the retransmission block.

In addition, in the aforementioned data communications, the number of retransmission blocks is specified to a minimum (1 in the above example), for reserving many blocks for retransmission use means poor data communications efficiency. In some cases, more blocks may need retransmission than the number of blocks reserved for retransmission use.

To address this constraint, claims 31, 35, and 42 include a feature that "if a retransmission of more blocks than retransmission-block fields has been requested,

some blocks to be transmitted in the data packet to which are added the blocks a retransmission of which has been requested are added to a subsequent data packet for transmission using the retransmission-block field."

As described in the present specification (page 8, line 16 to page 9, line 15; page 10, line 21 to page 11, line 18, as well as Fig. 1, P(5) to P(7)), when a retransmission request is made for two blocks (B (504), B (505)) in the packet P(5), B (504), B (505) are retransmitted in the next packet P(6), and the block B (606) which was to be transmitted in the packet P(6) is added to and transmitted in a next packet P(7). The addition and transmission of the block B (606) in the packet P(7) is done using the block reserved for retransmission. In the packet P(8) and following packets, communications returns to normal.

Differences over MacDonald and Lockhart

As noted above, the present invention reserves a predetermined bandwidth per data packet for handling retransmission requests. Thus, the inclusion of one or more retransmission blocks results in an increased number of blocks in a data packet up to the full bandwidth. Such an approach enables realtime throughput of good data blocks. MacDonald, on the other hand, uses an approach that reserves an address location in a buffer in order to ensure preservation of correct relative positions within the buffer without the need for numbering of the data blocks (MacDonald, Abstract; column 9, lines 46-57). In the case that an information block is received corrupted, the data block is still stored in the buffer even though retransmission will be requested. If the data block is not successfully repeated within a certain time period, it will be output to the demultiplexer even though it

contains a possible error in it (col. 9, lines 58-67). A data block is indicated as being a repeat by its repeat flag (RF in Figure 3). A frame consists of eight blocks (Figure 4). Thus, MacDonald does not ensure transmission of a fixed number of non-repeat blocks and would not result in an increased number of blocks being transmitted in the case retransmitted blocks are transmitted.

Therefore, Applicants submit that MacDonald fails to teach or suggest the claimed "adding a block, a retransmission of which has been requested, to a block constituting a data packet to be transmitted next or subsequently from the transmitting end, thereby increasing a number of blocks in the data packet for transmission." This argument applies to claims 30, 34, 41, 50, and 51.

Further, as per claim 48, Applicants submit that MacDonald fails to teach or suggest that the claimed, "communications apparatus selects only an undecodable block out of the data packet that has been received and makes a retransmission request; and the retransmission request includes an identification of a last outputted block in the data packet that has been received." MacDonald's retransmission request covers three consecutive blocks (column 10, lines 1-12).

With respect to claim 49, Applicants submit that MacDonald fails to teach or suggest at least the claimed retransmission request including "an identification of a last outputted block in the data packet that has been received and a number of blocks for which error-correction decoding has finished."

Lockhart discloses, "In step 310, the transmitter unit 100 receives the NAK message, compare function 156 identifies which sub-portion or sub-portions of the PDU was not or were not received correctly. Note that compare function 156 may identify that all sub-

portions check codes are correct. In this case, the entire packet is resent. Step 312 causes transmit packet assembler 158 to assemble and resend those blocks. The resend blocks are received at receiver unit 10 in step 320 and the packet is re-assembled in step 321. The packet is re-assembled by placing the newly received blocks in the appropriate place in received packet memory space 40." Thus, Applicants submit that Lockhart fails to make up for the above stated deficiencies in MacDonald.

Conclusion

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Robert W. Downs (Reg. No. 48,222) at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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Attachments: Abstract